PART B OF THE SUPPORTING STATEMENT

INFORMATION COLLECTION REQUEST

OMB Control Number 2060-0490
EPA ICR Number 1996.03

National Survey on Environmental Management of Asthma

U.S. Environmental Protection Agency
Office of Radiation and Indoor Air
Indoor Environments Division

INFORMATION COLLECTION REQUEST (OMB Control Number 2060-0490; EPA ICR No. 1996.03)

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1 – SURVEY OBJECTIVES, KEY VARIABLES, AND OTHER PRELIMINARIES

1(a) Survey Objectives

The Indoor Environments Division (IED) is working to integrate the management of environmental factors with the medical treatment of asthma, particularly among children and low-income populations. In an effort to evaluate the effectiveness of its current outreach efforts, EPA is proposing to conduct a survey of U.S. households to gain information regarding the number of individuals with asthma who have taken steps to improve the quality of their indoor environment as part of their approach to managing the disease, as well as any barriers they may have encountered while attempting to do so. EPA will compare the data gained from this survey to the Agency's established Government Performance and Results Act of 1993 (GPRA) goal of reducing the number of people with asthma who are exposed to environmental asthma triggers. Specifically, EPA's goal is that 2.5 million people with asthma, including one million children and 200,000 low-income adults, will have taken steps to reduce their exposure to indoor environmental asthma triggers by 2005.

EPA expects the following issues to be addressed by the *National Survey on Environmental Management of Asthma:*

Issue 1:	The extent to which measures to reduce exposure to indoor environmental asthma triggers are being used by individuals with asthma.
Issue 2:	The barriers to implementation, if any, that have been encountered by adults with asthma or parents of children with asthma in attempting to improve their indoor environment.

Issue 3: The proportion of children aged 6 and under, and under that age of 18, who are exposed to environmental tobacco smoke and the extent of that exposure.

Issue 4: Ways in which the Agency might better target its outreach efforts to encourage individuals with asthma, or parents of children with asthma, to improve the quality of their indoor environment.

Issue 5: Whether EPA has met its GPRA goal.

1(b) Key Variables

The key variables associated with this survey effort include:

- The level of knowledge possessed by adults with asthma (and the parents of children with asthma) about indoor environmental asthma triggers.
- Indoor environmental management measures being taken to avoid, or minimize the impact of, these triggers.
- Barriers to implementing indoor environmental management measures.

These key variables will be evaluated in terms of the demographic characteristics of the respondents, including age, race or ethnicity, household income, and level of education. The most significant variable, in terms of its potential influence on survey results, is the variety of indoor environmental management measures currently being used by people with asthma. This variable is directly related to the survey's primary objective, which is to determine the extent to which such measures are used by these individuals. The other key variables identified above may influence the likelihood that an asthmatic will implement measures to improve the indoor environment and therefore may also influence survey results.

1(c) Statistical Approach

In response to the GPRA, EPA has set a specific, quantitative goal related to reducing the exposure of people with asthma, particularly children and lower-income populations, to indoor environmental asthma triggers. The primary objective in conducting the *National Survey on Environmental Management of Asthma* is to measure the extent to which individuals with asthma are taking action to manage their exposure to indoor environmental asthma triggers. EPA estimates that one in ten individuals in the United States suffers from asthma (Mannino). Given the size of the potential sample population, EPA does not believe that it is practical to survey every person with asthma in the United States. Consequently, EPA will survey a subset of this group in such a way as to allow the Agency to draw conclusions about the group as a whole from

the responses received. Anecdotal information is not sufficient for this purpose; hence, EPA has chosen a statistical approach for the *National Survey on Environmental Management of Asthma*.

The survey asks a series of questions about the use of various measures to manage indoor environmental asthma triggers. An analysis of the results will allow EPA to assess its progress toward the Agency's GPRA goal and evaluate the effectiveness of current outreach efforts. In addition, the survey responses will also provide EPA with an indication of any barriers asthmatics may be experiencing in their attempts to implement environmental management practices. These data will allow the Agency to design outreach materials and activities to assist this group in overcoming obstacles and adopting sound indoor air quality management practices.

EPA will be assisted in this survey effort by an independent contractor who will be responsible for updating the survey response database; identifying the survey sample pool; overseeing the conduct of the telephone survey and capture of survey results; tabulating and analyzing data; and reporting results. The actual survey will be conducted by a firm that specializes in administering telephone surveys to the public about health-related topics. This firm will be chosen through a competitive process and will be required to carry out the survey in accordance with the methodology proposed in this ICR.

1(d) Feasibility

EPA has reviewed the administrative procedures necessary to conduct the *National Survey on Environmental Management of Asthma* and has concluded that it is feasible to undertake the survey. EPA has sufficient funding to conduct the survey and will put a contract in place to provide the necessary logistical support. The original survey (conducted in 2003) was peer-reviewed by staff of EPA's IED and EPA Regional offices to ensure that the questions asked will reveal sufficient information to adequately evaluate the implementation of measures to reduce exposure to indoor environmental asthma triggers and to ensure that the questions do not collect redundant information.

EPA estimates that the *National Survey on Environmental Management of Asthma* will take approximately seven to eight months to administer, capture and analyze survey responses, and report its findings. EPA plans to initiate its survey soon after receiving OMB approval and, therefore, expects to complete the survey well within the period for which this ICR is in effect.

– SURVEY DESIGN

2(a) Target Population and Coverage

Because there is no known source of information available to EPA which identifies individuals in the United States with asthma, the Agency is targeting U.S. households with telephones to identify eligible candidates for its survey. Random digit dialing will be used to select residential telephone numbers across the country. The Agency will over sample in those zip codes designated by U.S. Census data to have a higher proportion of low-income populations. The *National Survey on Environmental Management of Asthma* will be administered to only those households in which the respondent identifies that an individual with asthma resides in the home.

2(b) Sample Design

2(b)i Sampling Frame

87,652 households will comprise the sample frame for the *National Survey on Environmental Management of Asthma*. These households will be chosen randomly from all U.S. households with telephones. EPA will ensure that the contractor selected to generate the sample frame and administer the survey has the capability for random digit dialing residential telephones and access to regional data regarding low-income populations.

2(b)ii Sample Size

Of the 87,652 households in the sample frame, EPA expects to reach 52,591 individuals during the period for which this ICR is in effect. Of these individuals, EPA expects that 15 percent of households will contain an asthmatic, resulting in 7,889 eligible individuals. After responding to several screening questions, adults with asthma and parents of children with asthma will be invited to participate in a longer, more in-depth telephone survey. EPA estimates that approximately 74 percent, or 5,837 individuals, will agree to participate in the Agency's survey.

Only one individual per eligible household will be selected for a more in-depth survey. If the household contains more than one asthmatic, the following formula will apply:

- If both an adult and a child have asthma, questions will be asked about the child.
- If more than one child in the household has asthma, a random determination will be made as to which child the questions will be asked about.

- If more than one adult in the household has asthma, but there are no asthmatic children in the household, a random determination will be made as to which adult the questions will be asked of.

Because EPA may conduct some or all of this phase of its survey during a second telephone interview, it is likely that a small percentage of eligible participants will be unreachable. In addition, it is likely that passive refusals and terminations will be encountered at this phase. (See Appendix 2 for a complete discussion of passive refusals and terminations.) Ultimately, EPA expects to obtain completed survey responses from 4,961 individuals.

In selecting the sample size for the survey, the Agency evaluated a number of parameters including confidence levels, precision, and cost. EPA also considered the likely response rates for a survey of this kind. EPA selected a confidence level of 90 percent and a precision rate of three percent for each sample subset (i.e., children with asthma and low-income adults with asthma). This will result in better than a two percent precision rate for the survey as a whole at the 95 percent confidence level. The selection of these parameters, coupled with the expected response rates, led to the selection of the sample size.

EPA did consider higher and lower precision rates for the sample subsets. However, the Agency believed that a precision rate lower than the three percent selected would not yield sufficient information to draw valid conclusions about the management of indoor environmental asthma triggers among children and low-income adults with asthma. On the other hand, EPA determined that the added cost of substantially increasing the sample size, in order to achieve a greater than three percent precision rate among the sample subsets, was not warranted given the survey's ultimate objective. Moreover, the sample size selected will ensure a 95 percent confidence level in the survey's overall results and a 90 percent confidence level for each of the two sample subsets. This was considered sufficient to demonstrate the achievement of EPA's GPRA goal with a high degree of confidence.

2(b)iii Stratification Variables

EPA believes that the number of individuals in the United States suffering from asthma is reaching epidemic proportions. Within the affected population, the rate of increase is largest among children and low-income adults. Consequently, EPA created two substrata for the *National Survey on Environmental Management of Asthma*: children with asthma and low-income adults with asthma. Because of the confidentiality associated with medical conditions and treatments, EPA is unable to access information which would specifically identify children and low-income adults with asthma. Thus, the Agency cannot create separate sampling frames for these two

substrata. To compensate, EPA has designed the survey to ensure that a sufficient number of households will be sampled to provide enough information about children and low-income adults with asthma to draw valid conclusions about these populations. Of the 7,889 eligible respondents, EPA expects that 25 percent will live with a child with asthma (Mannino). Based on its best professional judgment, EPA anticipates that the majority of these respondents will participate in the full survey, thus providing sufficient data about children with asthma (Hemmelgarn). In addition, EPA intends to over sample in communities known to have a high percentage of low-income households in order to ensure that survey results will yield sufficient information to draw valid conclusions about this population. As a result of this stratification, the precision rate of the overall survey will improve.

2(b)iv Sampling Method

To select the survey sample, EPA will employ random digit dialing to obtain a sample of 87,652 publicly listed, residential telephone numbers, over sampling in low-income regions throughout the country. EPA will use U.S. Census data to identify first codes then telephone exchanges where a higher number of low-income individuals reside.

2(b)v Multi-Stage Sampling

EPA will conduct the *National Survey on Environmental Management of Asthma* in two phases. The survey will use random-digit dialing with a maximum of fourteen call attempts for the initial contact. In the first phase, individual respondents will be screened to identify residents with asthma. EPA estimates screening approximately 52,591 individuals during this phase of the survey[1]. Successful completion of the screening phase will identify the actual number of eligible respondents. At this time, EPA estimates that approximately 15 percent of U.S. households include at least one person with asthma (NCHS). Respondents determined to be eligible in the first phase will be asked to participate in the second phase of the survey consisting of a longer, more in-depth telephone survey. EPA estimates that 74 percent of those eligible to participate in the second phase of the survey will agree to do so (Hornik, *et. al.*).

Since respondent time or contractor staffing may not allow completion of the second phase immediately after completion of the screening survey, eligible respondents who have completed the screening and have agreed to participate in the full survey may need to be re-contacted. The primary obstacle to the response rate for this phase of the survey is the ability to reach eligible

[1]See Appendix 2 for a full explanation of how response rates were derived.

respondents at a convenient time when they are at home. To overcome this, each individual will be asked during the first phase about the best time for future contacts. This will reduce the chance that a respondent who has agreed to participate cannot be contacted. EPA expects to reach 85 percent of those respondents who agreed in the first phase of the survey to participate in the full asthma survey (Hornik, *et. al.* and Mishra, *et. al.*).

2(c) Precision Requirements

2(c)i Precision Targets

EPA's survey has been designed to ensure that, at the 95 percent confidence level, its estimate of the number of individuals taking steps to reduce their exposure to indoor environmental asthma triggers is within two percentage points of the true value. For each sample subset, the Agency expects to achieve results within three percentage points of the true value at the 90 percent confidence level. EPA feels that these precision rates will be more than adequate to characterize the extent to which the results measured by its survey are true characteristics of our nation's asthmatic population and not a function of the margin of error.

2(c)ii Nonsampling Error

EPA expects that the largest nonsampling errors which could potentially bias its survey are associated with eligibility and nonresponse. The eligibility rate will have the greatest impact on the survey sample due to the relatively low rate of incidence (approximately 10 percent) of *asthma in the general population. However, because the survey does not seek to measure data on the* indoor environmental management practices of the population as a whole, this factor (i.e., ineligibility to participate) has no effect on the accuracy and precision of survey results.

Another potential source of bias is that eligible respondents may choose not to participate in the survey. This can occur for two reasons. It may be impossible to reach potential respondents. To minimize this possibility, EPA will utilize random-digit dialing with a maximum of fourteen call attempts for each phase of the survey. Another reason for nonresponse may be the refusal of potential respondents to participate in the survey. However, health-related surveys report a better-than-average response rate (Hemmelgarn). In addition, the salesman's "foot-in-the-door" effect (Hornik, *et al.*) suggests that compliance with a small request significantly enhances the likelihood of compliance with a subsequent "target" request. In other words, people who are willing to participate in the screening survey can be expected to participate in the full asthma survey.

With this in mind, EPA estimates that of the 87,652 households which make up the sampling frame, 60 percent, or 52,591, will be contacted successfully and will agree to participate in the screening survey. Of these 52,591 individuals, EPA expects that 15 percent, or 7,889 individuals, will either have asthma or live with someone who does. Only those individuals who have asthma or live with someone who does are considered to be eligible respondents.

EPA estimates that approximately 74 percent of the 7,889 eligible respondents, or 5,837 individuals will agree to participate in the Agency's survey. The Agency expects to achieve completed surveys for 4,961 of these individuals

The overall response rate or the number of survey responses completed vs. the number of eligible households (4,961 complete survey responses ÷ 7,889 eligible households) equals 63 percent.

Based on this expected response rate, EPA has selected a sample size large enough to yield the number of responses necessary to achieve a two percent precision rate at the 95 percent confidence level for the overall survey results and a three percent precision rate at the 90 percent confidence level for each substrata.

Since EPA recognizes that an advance letter increases survey response rates, EPA will likely send an advance letter for this survey and will follow a protocol similar to that used for the 2003 survey. EPA expects a strong response to the *National Survey on Environmental Management of Asthma* based on several factors. The survey will be conducted by telephone and multiple attempts will be made to reach potential respondents. The literature suggests that surveys collecting information about children's health issues have higher response rates than other types of surveys. Finally, the similar survey conducted in 2003 had higher than expected response rates. However, the Agency will take additional steps to increase response rates, including:

- Calling at hours when people are likely to be at home (e.g., after 6:00 PM).

- Scheduling call back times when it is convenient for people to take the survey.

2(d) Questionnaire Design

A discussion of the data elements contained in the *National Survey on Environmental Management of Asthma* is included in Section 4(b)(ii) of Part A of the Supporting Statement for this ICR. The survey seeks information about the measures taken by people with asthma (and parents of children with asthma) to minimize exposure to indoor environmental asthma triggers. All of the questions asked are linked to the survey's objective of determining the extent to which indoor environmental management measures are used by these individuals.

For this survey, EPA will make minor revisions to the survey instrument used in the 2003 survey. Respondents will continue to provide primarily yes/no responses. In some cases, respondents were given a range of responses in the form of multiple choice questions and were asked to indicate the one which best defined their response. The 2005 survey will continue to seek information on environmental management measures that the Agency considers important in reducing an individual's exposure to known indoor environmental asthma triggers. By using yes/no and multiple choice questions, the Agency will keep to a minimum the amount of time necessary for the respondent to complete the survey and will ensure consistency in data response and interpretation.

The original survey instrument (for the 2003 survey) was developed in consultation with staff from EPA's IED, EPA Regional offices, and the National Center for Health Statistics (NCHS) to ensure that respondents will understand the questions asked and will provide the type of data necessary to measure the Agency's objectives. That survey was also designed with the help of a statistician to ensure the reliability of the data. If necessary, revisions to the 2003 survey instrument will undergo the same peer review.

3 – PRETESTS AND PILOT TESTS

For the 2003 survey instrument, EPA conducted a pretest with nine adult asthmatics or parents of children with asthma. These participants were selected from a list of potential respondents identified by EPA staff and its cooperative partner, the Asthma and Allergy Network/Mothers of Asthmatics. All nine responded to the pretest by completing both the screening survey and the survey itself through a telephone interview. All respondents found the survey to be easy to understand and complete. In addition, the time it took for each respondent to participate in the survey was not considered to be overly burdensome. Several of the pretest respondents made suggestions regarding the survey's format and content, and EPA made minor adjustments to the survey instrument based on that feedback. EPA also submitted the draft questionnaire to the

NCHS cognitive testing laboratory and made adjustments to the questionnaire based on the feedback received.

Once revisions and updates are made to the original survey instrument, EPA may decide to pretest the new instrument in a similar manner.

4 – COLLECTION METHODS AND FOLLOW-UP

4(a) Collection Methods

EPA has chosen to conduct its survey by telephone interview for three reasons:

- The Agency has no way of targeting the intended respondents (i.e., people with asthma). Consequently, EPA considered a telephone interview more efficient than distributing a survey by mail, to determine eligibility.
- The survey questions are tailored to the responses of the participant and, therefore, require an interactive interview which cannot be accomplished using a mail survey.

- Based on statistical literature, EPA expects a higher response rate with a telephone survey than with a mailed survey. A higher response rate decreases the size of the sample frame needed, and the level of follow-up required, to achieve the Agency's target precision rates and confidence levels.

Therefore, EPA will administer the *National Survey on Environmental Management of Asthma* using telephone interviews.

EPA will seek a firm knowledgeable in environmental health issues, particularly indoor air quality and asthma, to administer the survey. Interviewers will receive training on the intent of the survey, the range of potential responses, and definitions of key terms used or addressed by the survey.

4(b) Survey Response and Follow-Up

The target response rate for the *National Survey on Environmental Management of Asthma* is 63 percent. Actual response rates, for both the screening survey and the survey itself, will be measured using the following formula:

Survey Screening: Response Rate = Number of Responses ÷ Number of Different Telephone Numbers Called

Survey:	Response Rate = Number of Responses ÷ Number of Eligible Respondents Identified in the Survey Screening

The Agency's contractor will be responsible for preparing and mailing advance letters, tracking survey responses, conducting survey interviews, entering survey results into the program database, maintaining the data in a secured environment, and providing quality assurance/quality control of all survey activities. The contractor will also be responsible for ensuring the accuracy and completeness of collected information. A computer database will be updated to guide interviewers through the survey and will prompt the interviewer to ask appropriate questions based on the responses received. The interviewers will enter data as the survey is being conducted, and the database will have error-checking features to ensure that data are entered correctly and provide sufficient information to interpret results. Following data entry, a final review of survey responses will be performed to identify numerical outliers in individual responses. Outliers will be evaluated, modified within the database where appropriate, or marked as invalid. Those records marked as invalid will be dropped from the response pool.

5 – ANALYZING AND REPORTING SURVEY RESULTS

5(a) Data Preparation

Data will be entered into the *National Survey on Environmental Management of Asthma* database by EPA contractor staff at the time of the interview. As mentioned in Section 4(b), the database will lead the interviewer and respondent through a series of questions tailored to the responses provided. This design feature will eliminate the possibility for interviewer error in the type and progression of questions asked and will minimize the potential for error due to incomplete responses. The database will incorporate error-checking features and will prompt the interviewer during the course of the survey when errors in data entry or completeness are detected. This design feature will reduce the potential for outliers or invalid responses to individual questions.

5(b) Analysis

The data obtained through this survey will be aggregated and analyzed for the purpose of evaluating the progress made toward meeting EPA's GPRA goal. Data concerning specific asthma triggers will be correlated to the appropriate indoor environmental management measures. For example, if a respondent considers molds to be an asthma trigger, that information will be correlated with the questions concerning ways in which to control mold in the home. In this way, EPA can determine if respondents are taking appropriate actions to minimize or avoid the impact of indoor environmental asthma triggers. Based on the number of respondents who indicate that they are using indoor environmental management measures, EPA will extrapolate a percentage

value as it relates to the asthmatic population as a whole in the United States. By doing so, the Agency can determine its progress towards meeting its GPRA goal.

Data will also be tabulated for each section of the questionnaire based on the number of like responses to each question. In this way, EPA can evaluate trends in terms of common barriers, control measures most likely to be taken, etc. This information can then be used by EPA to guide its asthma program and the implementation of future outreach initiatives. Data will be compiled in a set of tables similar to the following example:

Table 5.1 –Control Method Used for Roaches

Asthma Trigger	Do Nothing	Use Roach Pesticide Spray	Use Roach Traps	Use Boric Acid	Other
Cockroaches					

Each type of analysis will include an estimate of the relative error associated with the data reported.

Nonresponse is unavoidable in any survey. Nonresponse may be a source of bias in the survey estimates if the nonrespondents tend to fall into certain categories. For example, if most non-respondents live in the Midwest, this may indicate a source of bias. If the response rates are not equal for all sampled units, this may suggest nonresponse bias and the estimates calculated using base weights applied only to the sample respondents may be biased. To evaluate this possibility, survey subclasses (cells) will be developed based on geographic region, metropolitan area versus non-metropolitan area, and income class. Unit nonresponse rates will be estimated for each cell. If the unit nonresponse rates differ significantly across the defined cells, then it will be necessary to make adjustments for the nonrespondents when calculating the survey estimates.

To reduce nonresponse bias as much as possible, adjustment factors will be computed independently for each cell. The base weights of respondents in each cell will be adjusted upward, so that the respondents in each cell will represent both the nonrespondents and the unsampled households in that cell. Although it is not possible to eliminate nonresponse bias entirely, the weight adjustment procedure is expected to reduce nonresponse bias in the survey statistics to an acceptable level.

This approach for analyzing the potential for nonresponse bias is based on the following two references:

- Survey of Research and Development Funding and Performance by Nonprofit Organizations: 1996 and 1997, Methodology Report, National Science Foundation, 2000. (http://www.nsf.gov/sbe/srs/srdfpnpo/meth9697/start.htm)

- Commercial Buildings Energy Consumption Survey (CBECS), Technical and Methodological Information: Nonsampling and Sampling Errors, U.S. Department of Energy, 1999. (http://www.eia.doe.gov/emeu/cbecs/tech_errors_nonresponse.html)

5(c) Reporting Results

The results of the survey will be compiled into a summary document and will be made available to the U.S. Congress during EPA's reporting of its GPRA goals. Additionally, IED will report to EPA's Information Strategies Branch on the results of the survey process and, upon request, make copies of the survey instrument and this ICR available as a reference for other EPA program offices undertaking large-scale survey and program evaluation efforts. EPA will not have direct access to personal identifiers. Raw survey data will be stripped of all personal identifiers by the contractor before being released to the Agency.